CLAIMS

I claim:

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1. A computer system comprising:

a host system, which includes a host operating system (OS) and at least one system resource; and

at least one guest system, each of which includes a guest OS and is operatively connected to the host system;

each guest OS being provided with resource request means for reserving the system resource from within the respective guest OS, thereby making the resource available to the host system.

2. A system as in claim 1, in which the resource request means is a driver installed within each respective guest OS.

3. A system as in claim 2, in which there is a plurality of guest systems operatively connected to the host system, further comprising:

a resource scheduler in the host system for allocating the system resource among the guest systems;

for each guest system, a communications means for communicating a respective resource quantity request to each driver;

each driver, upon sensing the respective resource quantity request, being provided for reserving, via the corresponding guest OS, an amount of the system resource corresponding to the resource quantity request.

4. A system as in claim 3, in which:

each guest OS includes resource reservation means for reserving specified amounts of the system resource;

the driver is operatively connected to the resource reservation means for communicating the resource quantity request to the resource reservation means; and

the resource reservation means of each guest OS is native to the guest OS, all communication between the resource scheduler and the guest systems taking place via the respective drivers, the resource scheduler thereby remaining transparent to the guest systems.

5. A system as in claim 4, in which each guest system is a virtual machine.

6. A system as in claim 5, further including, for each virtual machine, a virtual machine monitor forming an interface between the resource scheduler and each respective virtual machine.

7. A system as in claim 4 in which:

the system resource is system machine memory;

the guest OS allocates and deallocates physical memory to applications and drivers loaded within and connected to the guest OS, physical memory being a portion of the system machine memory that may be reserved by any guest system;

upon an increase in the resource quantity request for a specified one of the drivers, the guest OS reserves for the specified driver a corresponding quantity of physical memory, the driver thereby making the system machine memory corresponding to the reserved physical memory available for allocation by the host OS to other guest systems; and

upon a decrease in the resource quantity request for the specified one of the drivers, the corresponding specified guest OS deallocates a corresponding quantity of

physical memory, thereby reserving the system machine memory corresponding to the deallocated physical memory for use solely by the specified guest system.

8. A system as in claim 4, in which the resource requesting means is further provided for adapting a rate at which it reserves the system resource via the guest OS to be no greater than a current maximum reservation change rate of the guest OS.

9. A system as in claim 1, in which the resource request means is a user-level application loaded in the guest system and running on the guest OS.

10. A system as in claim 1, in which the system resource is system memory.

11. A system as in claim 1, in which:

the host system includes a plurality of processors; and

the system resource is the plurality of processors, the resource quantity request indicating to the resource request means in each respective guest system a number of the plurality of processors to be reserved by each guest system, thereby making the reserved processors available for reallocation by the host system.

12. A computer system comprising:

a host system, which includes a host operating system (OS) and at least one system resource; and

a plurality of guest systems operatively connected to the host system, each of which includes a guest OS;

a resource scheduler in the host system for allocating the system resource among the guest systems;

for each guest system, a communications means for communicating a respective resource quantity request to each driver;

each guest OS being provided with resource request means for reserving the system resource from within the respective guest OS, thereby making the resource available to the host system;

in which:

the resource request means is a driver installed within each respective guest OS;

each driver, upon sensing the respective resource quantity request, reserves, via the corresponding guest OS, an amount of the system resource corresponding to the resource quantity request;

each guest OS includes resource reservation means for reserving specified amounts of the system resource;

the driver is operatively connected to the resource reservation means for communicating the resource quantity request to the resource reservation means;

the resource reservation means of each guest OS is native to the guest OS, all communication between the resource scheduler and the guest systems taking place via the respective drivers, the resource scheduler thereby remaining transparent to the guest systems;

the system resource is system machine memory;

the guest OS allocates and deallocates physical memory to applications and drivers loaded within and connected to the guest OS, physical memory being a portion of the system machine memory that may be reserved by any guest system;

upon an increase in the resource quantity request for a specified one of the drivers, the guest OS reserves for the specified driver a corresponding quantity of physical memory, the driver thereby making the system machine memory corresponding to the reserved physical memory available for allocation by the host OS to other guest systems; and

upon a decrease in the resource quantity request for the specified one of the drivers, the corresponding specified guest OS deallocates a corresponding quantity of physical memory, thereby reserving the system machine memory corresponding to the deallocated physical memory for use solely by the specified guest system.

13. In a computer system that comprises a host system, which includes:

a host operating system (OS),

at least one system resource that is included within the host system; and

at least one guest system, which includes a guest OS and is operatively connected to the host system,

a method comprising the step of reserving the system resource from within the guest OS, thereby making the resource available to the host system.

14. A method as in claim 13, further including the following steps:

communicating a resource quantity request from a resource scheduler in the host system to a driver located within the guest OS; and

reserving, via the corresponding guest OS, an amount of the system resource corresponding to the resource quantity request.

15. A method as in claim 14, in which the step of reserving the amount of he system is performed using a resource reservation mechanism that is native to the guest OS, all communication between the resource scheduler and the guest systems taking place via the respective drivers, the resource scheduler thereby remaining transparent to the guest systems.

16. A method as in claim 15, further comprising the following steps:

implementing the guest systems as virtual machines; and

providing communication between each virtual machine and the host system via a virtual machine monitor.

17. A method as in claim 16, in which the system resource is system machine memory, further including the following steps:

allocating and deallocating physical memory from within the guest OS to applications and drivers loaded within and connected to the guest OS, physical memory being a portion of the system machine memory that may be reserved by any guest system;

upon an increase in the resource quantity request for a specified one of the drivers, reserving for the specified driver, via the corresponding specified guest OS, a corresponding quantity of physical memory, the driver thereby making the system machine memory corresponding to the reserved physical memory available for allocation by the host OS to other guest systems; and

upon a decrease in the resource quantity request for the specified one of the drivers, deallocating a corresponding quantity of physical memory, thereby reserving the system machine memory corresponding to the deallocated physical memory for use solely by the specified guest system.

18. A method as in claim 13, in which the system resource is system memory.

19. A method as in claim 13, in which the system resource is a plurality of processors within the host system.

20. A method as in claim 17, further including the step of adapting a rate at which the system resource is reserved via the guest OS to be no greater than a current maximum reservation change rate of the guest OS.

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